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STATE HORTICULTURAL DEPARTMENT.

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FALL TREATMENT FOR SAN JOSE SCALE.

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GENERAL REMARKS.

The rather unusually good returns that the orchardists of the State have enjoyed the past year will be an incentive; first, to those who have benefitted by the same to give their orchards even more attention than in the past, and secondarily to those who have neglected their orchards to give them better attention in the future.

While there is no doubt that the progressive orchardists in the State have the San Jose scale under control, yet there are many orchards in every locality where the pest is present and doing a deal of injury to the trees. It is for the benefit of the latter class that this preliminary circular bulletin is issued, with the hope that those who have badly infested orchards will give them their attention and apply an effective remedy this fall.

It is of prime importance that fruit growers keep a close watch over their orchards and often examine the twigs and branches of trees so that if they should become infested they will be able to take it in hand before it does any appreciable damage. Where infested trees have been found here and there in an orchard, the scale is in all probability much more generally distributed than an inspection would ordinarily indicate. Under these circumstances the whole orchard should be sprayed. Any signs of failing vigor or unnatural appearance of the bark should at once call for a close inspection. In this way serious loss may frequently be prevented, and the presence of injurious insects or diseases be detected as soon as possible after their establishment in the orchard. When you are in doubt of the trouble send some twigs at once to this office, and the matter will be given immediate attention.

As is well known, the most effective time to treat the San Jose scale is when the tree or plant which it infests is in the dormant state, as at that time the absence of foliage enables more thorough treatment; that is, all of the surface of the tree may be more

easily covered, which is very important, and moreover, a stronger wash may be applied against the scale than otherwise would be safe for the welfare of the tree in foliage.

It has been demonstrated that in badly infested orchards two treatments with a dormant wash will prove profitable; that is, one application in the fall after the trees lose their leaves, and the second in the early spring just before the buds begin to swell. But if the orchard is only slightly infested, requiring one treatment this season, it is better to apply it in the early spring. Also if circumstances will allow only one treatment the early spring application will prove more beneficial in controlling the pest.

WASHES THAT MAY BE EMPLOYED.

This circular is a preliminary announcement of the results from experiments by this Department the past year.

LIME, SULFUR AND SALT WASH.

Without doubt, the lime, sulfur and salt wash is preëminently the cheapest and most efficient remedy for the San Jose scale where it can be employed. In our experiments we have employed various formulas and different methods of preparation, which will be enumerated in a coming bulletin of the Experiment Station. Suffice it to say here, that making the wash according to the following formula will give the most effective results with the least trouble of preparation:

Fresh stone lime, 20 pounds;
Flowers of sulfur, 15 pounds;
Common salt, 10 pounds.
Water to make 50 gallons.

Directions: Boil 20 gallons of water in an iron pot or hog scalding; now add the proper quantity of stone lime, also the sulfur, which should have been previously mixed with a little hot water to form a paste. Add the salt a little later when the mass is boiling. If the water was boiling when the lime and sulfur were added, in about 30 minutes, if the mass has cooked vigorously, the mixture should be in good condition; that is, the sulfur should be thoroughly dissolved, producing a clear, amber-colored solution. The mixture should be stirred, and, if necessary, more water added to prevent boiling over or burning. When the mixture has boiled sufficiently, add the amount of hot or cold water to make 50 gallons, and carefully strain, through a strainer having about 20 meshes to an inch, into the spray barrel and apply warm. No doubt the wash will usually work better if hot water is used in diluting the mixture, but we have found equally good results in diluting with cold water; since, if cold water is used to dilute the mixture, the whole solution still remains somewhat warm. This usually saves trouble in heating a greater amount of water.

In making the wash on a very large plan, it is best to employ steam to cook the mixture. Barrels are then used in which to place the materials; it is then made as above stated. It may be mentioned that one can do no harm by cooking the mixture for a longer period than stated here, but 20 to 30 minutes is the minimum after the materials are added to the hot water.

Another method employed by some orchardists is to boil 15 to 20 gallons of water, and pour this amount of hot water into a barrel containing the given amount of stone lime, which in this case should be 30 to 40 pounds, instead of 20 pounds, as they depend on the heat generated by the slacking of the lime to make the combination with the lime and sulfur. The sulfur, in form of a paste, is added with the hot water. The barrel is covered over with a sack to retain the heat, and the mass is occasionally stirred to prevent burning. After the lapse of about 20 or 30 minutes, sufficient cold water is added to make the 50 gallons. The whole is then strained into the spray barrel. If good lime is used, one can secure a fairly good solution by this method, but there is not much labor saved in this manner, and there is no doubt there will be more free sulfur in the solution, thereby reducing the efficiency of the wash.

CAUSTIC SODA.

Many orchardists in the State during the past year have employed caustic soda 78% as a wash against the San Jose scale. In some cases it proved fairly effective in killing a large amount of scale, but in others we have observed very poor results as against the lime, sulfur and salt wash. In our experiments, the caustic soda wash was decidedly unsatisfactory. It is yet to be seen whether the caustic soda will be finally injurious to trees. Our observations to date, from trees that were sprayed last spring, show no signs of injury. No doubt, caustic soda wash is not so troublesome to make as the lime, sulfur and salt; for this reason many prefer using it. For those who care to use this wash, applying it at the rate of 1 pound to 6 gallons of water, will be strong enough to kill quite a number of scale insects.

KIL-O-SCALE.

We have conducted many experiments with this patent insecticide, and we are not prepared at this time to either condemn or recommend it. We would not advise orchardists using it at this time, until more work can be done with it. In our earlier experiments at the rate of 1 part of Kill-o-scale to 20 or 30 parts of water, as the manufacturers recommended it, did not give satisfaction. Some later tests with modified and stronger solutions, applied while the young were crawling, showed fairly good results.

WEBCIDE.

This is another patent insecticide which is on the market and which we have included in our experiments. Our results indicate that it is not a satisfactory remedy for the San Jose scale.

CON-SOL AND SAN JOSE EXTERMINATOR.

These solutions are claimed to be extracts of the lime, sulfur and salt wash, or rather the total amounts of the different materials used for making a barrel of the wash in the regular manner concentrated to one gallon. They recommend that this gallon be diluted to 50 gallons of water. These solutions, while they kill some scale, cannot be recommended at this time as an efficient remedy for scale, as the regular lime, sulfur and salt wash.

Each of these patent preparations are more expensive than the regular lime, sulfur and salt wash.

WHALE OIL SOAP.

This substance is effective in controlling the San Jose scale, but its expensiveness has no doubt prevented its adoption. Whale Oil Soap should be applied in early spring at the rate of 2 pounds to the gallon of water.

MODE OF APPLICATION.

Any pump that has all the working parts brass and furnishes a constant high pressure may be used, and, in general, a nozzle that is suitable for the application of Bordeaux Mixture can be used with any of the above mentioned washes. Always clean the pump thoroughly after using by washing out with hot, clear water.

In applying lime, sulfur and salt wash and caustic soda, as they are somewhat disagreeable to use, the sprayman should provide himself with a rubber or oil skin coat, hat and gloves, and many have found a pair of goggles, with clear glasses, very useful. It is a good plan to throw a blanket or sack over the horses. In the application of these washes, the main point to be observed is to be very careful that all the parts of the tree are treated. It is of advantage to have the hose of sufficient length to enable the sprayman to encircle the tree and finish it before leaving. Upon drying, trees treated with the lime sulfur and salt wash present a whitened appearance, very much as if whitewashed, and it is then very easy to detect any parts that have not been treated.

There are many good spray pumps on the market, and it is left to the individual to decide and select the one best suited to his needs. There are also several power sprayers available. We hope to experiment with some of these at the coming meeting of the State Horticultural Society, which will be held at the Maryland Agricultural College, College Park, Md., Dec. 28 and 29, 1904.